09/445033

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 01 March 2000 (01.03.00)	
International application No. PCT/GB98/01651	**Applicant's or agent's file reference** 30.49.68439
International filing date (day/month/year) 05 June 1998 (05.06.98)	**Priority date** (day/month/year) 06 June 1997 (06.06.97)
Applicant LARSEN, Mark, Sievert et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

22 December 1998 (22.12.98)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Ting Zhao
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

United States Patent and Trademark Office
(Box PCT)
Crystal Plaza 2
Washington, DC 20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 27 January 1999 (27.01.99)	
International application No. PCT/GB98/01651	**Applicant's or agent's file reference** 30.49.68439
International filing date (day/month/year) 05 June 1998 (05.06.98)	**Priority date** (day/month/year) 06 June 1997 (06.06.97)
Applicant LARSEN, Mark, Sievert et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

22 December 1998 (22.12.98)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [ ] was

[X] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Lazar Joseph Panakal
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
30.49.68439		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/GB 98/01651	05/06/1998	06/06/1997

Applicant

SALBU RESEARCH AND DEVELOPMENT (PROPRI..et al.

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. [ ] **Certain claims were found unsearchable** (see Box I).

2. [X] **Unity of invention is lacking** (see Box II).

3. [ ] The international application contains disclosure of a **nucleotide and/or amino acid sequence listing** and the international search was carried out on the basis of the sequence listing
   - [ ] filed with the international application.
   - [ ] furnished by the applicant separately from the international application,
     - [ ] but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
   - [ ] Transcribed by this Authority

4. With regard to the **title,**
   - [X] the text is approved as submitted by the applicant.
   - [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**
   - [X] the text is approved as submitted by the applicant.
   - [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this International Search Report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is:

   Figure No. 1
   - [X] as suggested by the applicant.
   - [ ] because the applicant failed to suggest a figure.
   - [ ] because this figure better characterizes the invention.
   - [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 98/01651

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☒ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-26,30

   Method of operating a communications network comprising the transmission of probe signals to discover the availability of other stations in the network as destination or intermediate stations

2. Claims: 1,27-29

   Method of operating a communication network comprising a method of distribution of updated software for the operation of the stations.

INTERNATIONAL SEARCH REPORT

[redacted] ational Application No
CT/GB 98/01651

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 485 578 A (SWEAZEY PAUL) 16 January 1996 see claims ---	1,30
A	US 4 864 563 A (PAVEY CHARLES F ET AL) 5 September 1989 see column 4, line 11 - column 6, line 30 see column 7, line 10 - line 28 ---	1,5,6,8, 25,30
A	DUBE R ET AL: "SIGNAL STABILITY-BASED ADAPTIVE ROUTING (SSA) FOR AD HOC MOBILE NETWORKS" IEEE PERSONAL COMMUNICATIONS, vol. 4, no. 1, February 1997, pages 36-45, XP000679252 see abstract see page 38, left-hand column, line 20 - line 60 --- -/--	2,3,9-13

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 December 1998	05.01.99

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Perez Perez, J

2

Form PCT/ISA/210 (second sheet) (July 1992)

[redacted]ational Application No
[redacted]CT/GB 98/01651

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 430 729 A (RAHNEMA MOE) 4 July 1995 see column 5, line 35 - line 56 see column 11, line 24 - line 47	14-18
A	ALBANESE A ET AL: "A ROUTING STRATEGY FOR INTERCONNECTING HIGH-SPEED METROPOLITAN AREANETWORKS1" COMPUTER COMMUNICATION TECHNOLOGIES FOR THE 90'S, TEL AVIV, OCT. 30 - NOV. 3, 1988, no. CONF. 9, 30 October 1988, pages 303-309, XP000077391 RAVIV J see paragraph 6.2 see paragraph 6.3 see paragraph 6.5	22-24
A	WO 89 05551 A (NETWORK EQUIPMENT TECH) 15 June 1989 see claim 1	27-29

INTERNATIONAL SEARCH REPORT

[redacted]nation on patent family members

[redacted]ational Application No
[redacted]CT/GB 98/01651

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5485578 A	16-01-1996	NONE	
US 4864563 A	05-09-1989	NONE	
US 5430729 A	04-07-1995	CA 2142152 A	05-10-1995
		CN 1115529 A	24-01-1996
		DE 19505905 A	05-10-1995
		FR 2718314 A	06-10-1995
		GB 2288296 A,B	11-10-1995
WO 8905551 A	15-06-1989	US 4847830 A	11-07-1989
		AT 120919 T	15-04-1995
		AU 2824089 A	05-07-1989
		CA 1307350 A	08-09-1992
		DE 3853539 D	11-05-1995
		DE 3853539 T	14-12-1995
		EP 0396589 A	14-11-1990
		JP 3502742 T	20-06-1991

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
30.49.68439		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB98/01651	05/06/1998	06/06/1997
International Patent Classification (IPC) or national classification and IPC H04L12/56		
Applicant SALBU RESEARCH AND DEVELOPMENT (PROPRI..et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
22/12/1998	03.08.99
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer Cretaine, P Telephone No. (+49-89) 2399

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB98/01651

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-58	as originally filed				

Claims, No.:

2 (part),3-29, 30 (part)	as originally filed				
1,2 (part), 30 (part)	as received on	20/07/1999	with letter of	19/07/1999	

Drawings, sheets:

1/7-7/7	as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-30
	No:	Claims	
Inventive step (IS)	Yes:	Claims	2-29
	No:	Claims	1, 30
Industrial applicability (IA)	Yes:	Claims	1-30
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following document:

   D1 = US-A-5 485 578

2. The broad and vague formulation of **claim 1** is such (see also Item VIII) that its subject-matter appears to be easily derivable for a skilled person from the prior art disclosed in D1.

   In this respect, document D1 discloses (see the abstract and claims, the references in parentheses applying to this document) a method for operating a communication network (figure 1) comprising a plurality of stations ("nodes") each able to transmit and receive data so that the network can transmit data from an originating station ("source node") to a destination station ("target node") via at least one intermediate station ("bridge node"). This method comprises transmitting from a source node probe signals ("ping symbols") that are addressed to specific target nodes and issuing in response form the target nodes responses ("pong signals") which are returned back to the source node, directly or indirectly, if intermediate stations ("bridge nodes") are on the transmission path between the source and target nodes. The skilled person would interpret the word "channel" , which is not defined in **claim 1,** as a transmission path or physical connection in the network of D1. The "first predetermined criteria" in **claim 1** would correspond to the choice of the target nodes in D1. The skilled person would also interpret the "predetermined second criteria" defined in **claim 1** for evaluating the responses as being the type of echo symbol ("identification numbers") returned.

   Therefore the subject-matter of **claim 1** does not appear to involve an inventive step (Article 33(3) PCT).

3. The considerations expressed in section 2 concerning **claim 1** are also valid for independent **claim 30** because this claim contains the same features combination of method **claim 1** in terms of a system claim.

   Therefore the subject-matter of **claim 30** does not appear to involve an inventive step (Article 33(3) PCT).

4. The features defined in dependent claims 2 to 29 are not disclosed in or suggested by the documents cited in the international search report.

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

1. The following terms and wordings used in claims 1 and 30 are vague and unclear and leave the reader in doubt as to the meaning of the technical features to which they refer, thereby rendering the definition of the subject-matter of said claims 1 and 30 unclear (Article 6 PCT):

   - "calling channel": claim does not define any channel in the network and this term could mean either a partition of the transmission medium between a plurality of stations (e.g. a time slot in TDM networks, a frequency in FDM network) or the whole medium itself (e.g. a conductor linking two stations in a fixed wired network as in D1). Since claims 1 and 30 do not even define the type of network (wired, wireless, mobile, ...) the term "channel" could be interpreted by the skilled person as being a transmission path in a fixed wired network.

   - "first predetermined criteria" and "second predetermined criteria": these wordings do not define the criteria used as an infinity of choices exists, and do not limit the scope of claims 1 and 30.

   - "responding directly or indirectly" and "direct or indirect responses" are wordings which are not clear enough to describe that a response is transmitted through zero or at least one intermediate station.

   - "communicate optimally" refers to a quality of the communication which is however not defined by any criterium in claims 1 and 30.

   Therefore claims 1 and 30 do not meet the requirements of Article 6 PCT.

2. Since system claim 30 does not contain any structural features of the stations (e.g by using formulations of the type "means for..." or " means adapted for..."), it does also not meet the requirements of Article 6 PCT in respect of clarity as to the category (Guidelines PCT III-3.1).

3. The general statement "... incorporated herein by reference." in the description on pages 9 and 33 is not clear since the documents referred to are not relevant for the performance of the invention and said statement should have been deleted (Rule 5.1a)ii) PCT; Guidelines C-II, 4.17).

CLAIMS

1. A method of operating a communication network comprising a plurality of stations each able to transmit and receive data so that the network can transmit data from an originating station to a destination station via at least one intermediate station, the method comprising:

a) defining at least one calling channel;

b) selecting, ~~at each station~~ at intervals, and according to first predetermined criteria, a calling channel for the transmission of probe signals to other stations;

e) transmitting probe signals from each station ~~on the selected~~ at intervals, calling channel, other stations which receive the probe signals from a given station responding directly or indirectly to thereby indicate to the given station their availability as destination or intermediate stations; and

f) evaluating, at the given station, the direct or indirect responses of other stations to said probe signals according to second predetermined criteria, in order to identify other stations with which the given station can communicate optimally.

2. A method according to claim 1 wherein the other stations receiving the probe signals from the given station each modify their own probe signals to include data indicating the quality of the communication between the given station and themselves, the given station being

an originating station to a destination station via at least one intermediate station, each of the stations operating in use to:

a) define at least one calling channel;

e) select, at intervals, according to first predetermined criteria, a calling channel for the transmission of probe signals to other stations;

f) transmit probe signals to other stations at intervals on the selected calling channel, other stations which receive the probe signals from a given station responding directly or indirectly to thereby indicate to the given station their availability as destination or intermediate stations; and

g) evaluate the direct or indirect responses of other stations to said probe signals according to second predetermined criteria, in order to identify other stations with which the given station can communicate optimally.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

TOMLINSON,Kerry John
FRANK B. DEHN & CO.
179 Queen Victoria Street
London EC4V 4EL
GRANDE BRETAGNE

FILE 68439
- 5 AUG 1999
ANSL

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	03.08.99
Applicant's or agent's file reference 30.49.68439	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB98/01651	05/06/1998	06/06/1997

Applicant
SALBU RESEARCH AND DEVELOPMENT (PROPRI..et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Ahrens, R Tel.(+49-89) 2399-8136

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
30.49.68439		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB98/01651	05/06/1998	06/06/1997
International Patent Classification (IPC) or national classification and IPC		
H04L12/56		
Applicant		
SALBU RESEARCH AND DEVELOPMENT (PROPRI..et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
22/12/1998	03.08.99
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. (+49-89) 2399-0 Tx: 523656 epmu d Fax: (+49-89) 2399-4465	Authorized officer Cretaine, P Telephone No. (+49-89) 2399

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB98/01651

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-58	as originally filed				

Claims, No.:

2 (part),3-29, 30 (part)	as originally filed				
1,2 (part), 30 (part)	as received on	20/07/1999	with letter of	19/07/1999	

Drawings, sheets:

1/7-7/7	as originally filed				

2. The amendments have resulted in the cancellation of:

☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-30
	No:	Claims	
Inventive step (IS)	Yes:	Claims	2-29
	No:	Claims	1, 30
Industrial applicability (IA)	Yes:	Claims	1-30
	No:	Claims	

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following document:

   D1 = US-A-5 485 578

2. The broad and vague formulation of **claim 1** is such (see also Item VIII) that its subject-matter appears to be easily derivable for a skilled person from the prior art disclosed in D1.

   In this respect, document D1 discloses (see the abstract and claims, the references in parentheses applying to this document) a method for operating a communication network (figure 1) comprising a plurality of stations ("nodes") each able to transmit and receive data so that the network can transmit data from an originating station ("source node") to a destination station ("target node") via at least one intermediate station ("bridge node"). This method comprises transmitting from a source node probe signals ("ping symbols") that are addressed to specific target nodes and issuing in response form the target nodes responses ("pong signals") which are returned back to the source node, directly or indirectly, if intermediate stations ("bridge nodes") are on the transmission path between the source and target nodes. The skilled person would interpret the word "channel" , which is not defined in **claim 1**, as a transmission path or physical connection in the network of D1. The "first predetermined criteria" in **claim 1** would correspond to the choice of the target nodes in D1. The skilled person would also interpret the "predetermined second criteria" defined in **claim 1** for evaluating the responses as being the type of echo symbol ("identification numbers") returned.

   Therefore the subject-matter of **claim 1** does not appear to involve an inventive step (Article 33(3) PCT).

3. The considerations expressed in section 2 concerning **claim 1** are also valid for independent **claim 30** because this claim contains the same features combination of method **claim 1** in terms of a system claim.

   Therefore the subject-matter of **claim 30** does not appear to involve an inventive step (Article 33(3) PCT).

4. The features defined in dependent claims 2 to 29 are not disclosed in or suggested by the documents cited in the international search report.

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

2. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

1. The following terms and wordings used in claims 1 and 30 are vague and unclear and leave the reader in doubt as to the meaning of the technical features to which they refer, thereby rendering the definition of the subject-matter of said claims 1 and 30 unclear (Article 6 PCT):

   - "calling channel": claim does not define any channel in the network and this term could mean either a partition of the transmission medium between a plurality of stations (e.g. a time slot in TDM networks, a frequency in FDM network) or the whole medium itself (e.g. a conductor linking two stations in a fixed wired network as in D1). Since claims 1 and 30 do not even define the type of network (wired, wireless, mobile, ...) the term "channel" could be interpreted by the skilled person as being a transmission path in a fixed wired network.

   - "first predetermined criteria" and "second predetermined criteria": these wordings do not define the criteria used as an infinity of choices exists, and do not limit the scope of claims 1 and 30.

   - "responding directly or indirectly" and "direct or indirect responses" are wordings which are not clear enough to describe that a response is transmitted through zero or at least one intermediate station.

   - "communicate optimally" refers to a quality of the communication which is however not defined by any criterium in claims 1 and 30.

   Therefore claims 1 and 30 do not meet the requirements of Article 6 PCT.

2. Since system claim 30 does not contain any structural features of the stations (e.g by using formulations of the type "means for..." or " means adapted for..."), it does also not meet the requirements of Article 6 PCT in respect of clarity as to the category (Guidelines PCT III-3.1).

3. The general statement "... incorporated herein by reference." in the description on pages 9 and 33 is not clear since the documents referred to are not relevant for the performance of the invention and said statement should have been deleted (Rule 5.1a)ii) PCT; Guidelines C-II, 4.17).

CLAIMS

1. A method of operating a communication network comprising a plurality of stations each able to transmit and receive data so that the network can transmit data from an originating station to a destination station via at least one intermediate station, the method comprising:

a) defining at ~~least one~~ calling channel;

b) selecting, (at intervals,) ~~at each station~~ and according to first predetermined criteria, a calling channel for the transmission of probe signals to other stations;

e) transmitting probe signals from each station (at intervals,) on the selected calling channel, other stations which receive the probe signals from a given station responding directly or indirectly to thereby indicate to the given station their availability as destination or intermediate stations; and

f) evaluating, at the given station, the direct or indirect responses of other stations to said probe signals according to second predetermined criteria, in order to identify other stations with which the given station can communicate optimally.

2. A method according to claim 1 wherein the other stations receiving the probe signals from the given station each modify their own probe signals to include data indicating the quality of the communication between the given station and themselves, the given station being

an originating station to a destination station via at least one intermediate station, each of the stations operating in use to:

a) define at least one calling channel;

e) select, at intervals, according to first predetermined criteria, a calling channel for the transmission of probe signals to other stations;

f) transmit probe signals to other stations at intervals on the selected calling channel, other stations which receive the probe signals from a given station responding directly or indirectly to thereby indicate to the given station their availability as destination or intermediate stations; and

g) evaluate the direct or indirect responses of other stations to said probe signals according to second predetermined criteria, in order to identify other stations with which the given station can communicate optimally.

INTERN. IONAL SEARCH REPORT

...er ...nal Application No
PCT/GB 98/01651

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 485 578 A (SWEAZEY PAUL) 16 January 1996 see claims ---	1,30
A	US 4 864 563 A (PAVEY CHARLES F ET AL) 5 September 1989 see column 4, line 11 - column 6, line 30 see column 7, line 10 - line 28 ---	1,5,6,8, 25,30
A	DUBE R ET AL: "SIGNAL STABILITY-BASED ADAPTIVE ROUTING (SSA) FOR AD HOC MOBILE NETWORKS" IEEE PERSONAL COMMUNICATIONS, vol. 4, no. 1, February 1997, pages 36-45, XP000679252 see abstract see page 38, left-hand column, line 20 - line 60 --- -/--	2,3,9-13

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 December 1998	05.01.99

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Perez Perez, J

2

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 430 729 A (RAHNEMA MOE) 4 July 1995 see column 5, line 35 - line 56 see column 11, line 24 - line 47	14-18
A	ALBANESE A ET AL: "A ROUTING STRATEGY FOR INTERCONNECTING HIGH-SPEED METROPOLITAN AREANETWORKS1" COMPUTER COMMUNICATION TECHNOLOGIES FOR THE 90'S, TEL AVIV, OCT. 30 - NOV. 3, 1988, no. CONF. 9, 30 October 1988, pages 303-309, XP000077391 RAVIV J see paragraph 6.2 see paragraph 6.3 see paragraph 6.5	22-24
A	WO 89 05551 A (NETWORK EQUIPMENT TECH) 15 June 1989 see claim 1	27-29

INTERN. IONAL SEARCH REPORT

...formation on patent family members

...er ...nal Application No
PCT/GB 98/01651

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5485578 A	16-01-1996	NONE	
US 4864563 A	05-09-1989	NONE	
US 5430729 A	04-07-1995	CA 2142152 A	05-10-1995
		CN 1115529 A	24-01-1996
		DE 19505905 A	05-10-1995
		FR 2718314 A	06-10-1995
		GB 2288296 A,B	11-10-1995
WO 8905551 A	15-06-1989	US 4847830 A	11-07-1989
		AT 120919 T	15-04-1995
		AU 2824089 A	05-07-1989
		CA 1307350 A	08-09-1992
		DE 3853539 D	11-05-1995
		DE 3853539 T	14-12-1995
		EP 0396589 A	14-11-1990
		JP 3502742 T	20-06-1991

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 98/01651

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☒ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-26,30

   Method of operating a communications network comprising the transmission of probe signals to discover the availability of other stations in the network as destination or intermediate stations

2. Claims: 1,27-29

   Method of operating a communication network comprising a method of distribution of updated software for the operation of the stations.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : H04L 12/56 | A3

(11) International Publication Number: WO 98/56140

(43) International Publication Date: 10 December 1998 (10.12.98)

(21) International Application Number: PCT/GB98/01651

(22) International Filing Date: 5 June 1998 (05.06.98)

(30) Priority Data:
97/5022 6 June 1997 (06.06.97) ZA

(71) Applicant *(for all designated States except US)*: SALBU RESEARCH AND DEVELOPMENT (PROPRIETARY) LIMITED [ZA/ZA]; Portion 86–87 of Farm Doornkloof, Pretoria 0002 (ZA).

(71) Applicant *(for IS only)*: TOMLINSON, Kerry, John [GB/GB]; 79 Hove Park Road, Hove, East Sussex BN3 6LL (GB).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: LARSEN, Mark, Sievert [ZA/ZA]; 22 Darlington Road, Lynnwood Manor, Pretoria 0081 (ZA). LARSEN, James, David [ZA/ZA]; Portion 86–87 of Farm Doornkloof, Pretoria 0002 (ZA).

(74) Agent: TOMLINSON, Kerry, John; Frank B. Dehn & Co., 179 Queen Victoria Street, London EC4V 4EL (GB).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

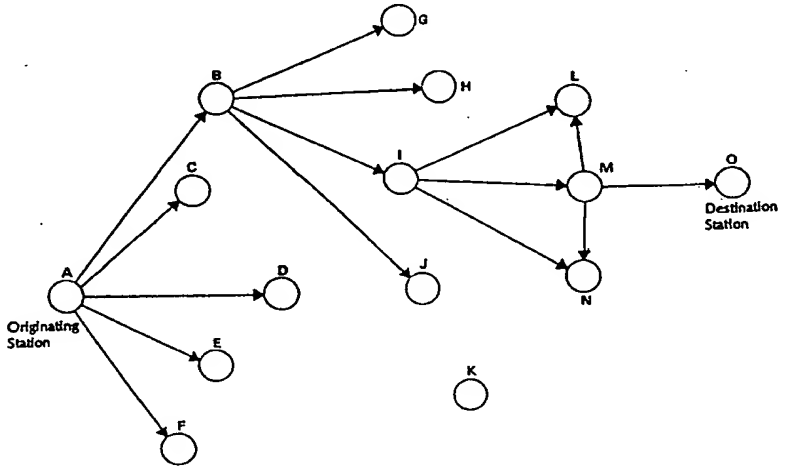
Published

With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(88) Date of publication of the international search report:
4 March 1999 (04.03.99)

(54) Title: METHOD OF OPERATION OF A MULTI–STATION NETWORK



(57) Abstract

The invention provides a method of operating a communication network. The network comprises numerous stations, each of which can transmit and receive data in order to transmit messages from originating stations to destination stations opportunistically via intermediate stations. Each station selects one of a number of possible calling channels to transmit probe signals to other stations. The probe signals contain data identifying the station in question and include details of its connectivity to other stations. Other stations receiving the probe signals respond directly or indirectly, thereby indicating both to the probing station and other stations their availability as destination or intermediate stations. The probing station evaluates the direct or indirect responses to identify other stations with which it can communicate optimally. For example, the stations may monitor the cumulative power required to reach another station, thereby defining a power gradient to the other stations, with stations selecting a route through the network which optimises the power gradient. Thus, data throughput through the network is maximised with minimum interference and contention between stations.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 98/01651

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 485 578 A (SWEAZEY PAUL) 16 January 1996 see claims ---	1,30
A	US 4 864 563 A (PAVEY CHARLES F ET AL) 5 September 1989 see column 4, line 11 - column 6, line 30 see column 7, line 10 - line 28 ---	1,5,6,8, 25,30
A	DUBE R ET AL: "SIGNAL STABILITY-BASED ADAPTIVE ROUTING (SSA) FOR AD HOC MOBILE NETWORKS" IEEE PERSONAL COMMUNICATIONS, vol. 4, no. 1, February 1997, pages 36-45, XP000679252 see abstract see page 38, left-hand column, line 20 - line 60 --- -/--	2,3,9-13

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 December 1998	05.01.99

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Perez Perez, J

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication.where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 430 729 A (RAHNEMA MOE) 4 July 1995 see column 5, line 35 - line 56 see column 11, line 24 - line 47	14-18
A	ALBANESE A ET AL: "A ROUTING STRATEGY FOR INTERCONNECTING HIGH-SPEED METROPOLITAN AREANETWORKS1" COMPUTER COMMUNICATION TECHNOLOGIES FOR THE 90'S, TEL AVIV, OCT. 30 - NOV. 3, 1988, no. CONF. 9, 30 October 1988, pages 303-309, XP000077391 RAVIV J see paragraph 6.2 see paragraph 6.3 see paragraph 6.5	22-24
A	WO 89 05551 A (NETWORK EQUIPMENT TECH) 15 June 1989 see claim 1	27-29

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 98/01651

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☒ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-26,30

   Method of operating a communications network comprising the transmission of probe signals to discover the availability of other stations in the network as destination or intermediate stations

2. Claims: 1,27-29

   Method of operating a communication network comprising a method of distribution of updated software for the operation of the stations.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GB 98/01651

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5485578	A	16-01-1996	NONE		
US 4864563	A	05-09-1989	NONE		
US 5430729	A	04-07-1995	CA	2142152 A	05-10-1995
			CN	1115529 A	24-01-1996
			DE	19505905 A	05-10-1995
			FR	2718314 A	06-10-1995
			GB	2288296 A,B	11-10-1995
WO 8905551	A	15-06-1989	US	4847830 A	11-07-1989
			AT	120919 T	15-04-1995
			AU	2824089 A	05-07-1989
			CA	1307350 A	08-09-1992
			DE	3853539 D	11-05-1995
			DE	3853539 T	14-12-1995
			EP	0396589 A	14-11-1990
			JP	3502742 T	20-06-1991